GREEN DESERTS? THE INVERTEBRATE FAUNA OF MOWN GRASS PLAYING FIELDS

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ABSTRACT

A suction sampler was used to collect invertebrates from short mown grass playing fields and utility lawns in London's Battersea Park. Thirty-five species were found, but of these only 21 occurred more than once, and seven very common species dominated the fauna. These comprised: four beetles *Bembidion lampros* (Herbst), *Kissister minimus* Aubé, *Tachyporus pusillus* Grav., *Megasternum obscurum* Marsh., the black pavement ant *Lasius niger* L., an unidentified springtail and an unidentified lyniphiid spider. Samples collected from similar areas of grass where the mowing regime had been relaxed for even short periods had increased species numbers.

INTRODUCTION

Despite the presence of many unusual and interesting insects in a few unmanaged parts of Battersea Park (Jones, 1999, 2001), the large areas of utility grass lawns, playing fields and sports grounds are bemoaned for being mundane, uninteresting and ecologically sterile. Various suggestions have been put forward as to how to improve the biodiversity of the short grass areas, without compromising their use by the general public for sports, games, walking, picnicking and the like. Key among these suggestions has been the idea to leave some areas of grass to grow long, and to manage them with a regime of hayfield or wildflower meadow management. Such areas might include around trees and shrubs bounding the edges of the park or the verges of some of the many tarmac paths passing through the park.

In the spirit of local experiment, managers at the Park agreed to look at these possibilities and commissioned this survey to examine the results. The first stage of the survey was to record species already existing in the short turf—the 'baseline' fauna before changes in management are implemented.

METHODS

Eleven sample sites in London's Battersea Park (VC17, 'Surrey') were visited on 18 June and 1 October 2002 (Fig.1). Areas 1–9 were all short mown grass around the southern and western edges of the Park. All 9 sites were part of the more or less continuous lawn-like mown grass that makes up most of Battersea Park. They were all regularly cut by tractor-drawn or 'ride-on' mowers using multiple cylinder-bladed cutting arrangements to a sward height of about 3 cm.

In addition, and by way of comparison, two further sample sites were selected. Area 10 was a rough and slightly uneven area of grass next to the gardening paddock and compost heaps. It was sometimes cut short, but was sometimes missed in the cutting regime. In May 2002 the grass was about 15 cm high and there were several clumps of *Urtica dioica* L. (Stinging Nettle), *Cirsium vulgare* L. (Spear Thistle) and *Senecio jacobaea* L. (Ragwort) nearby. In October 2002 it had been recently mown to about 5 cm high. Area 11 was an area of grass near Albert Bridge. It had previously been cut short, but had been allowed to grow long (about 25–30 cm) during building

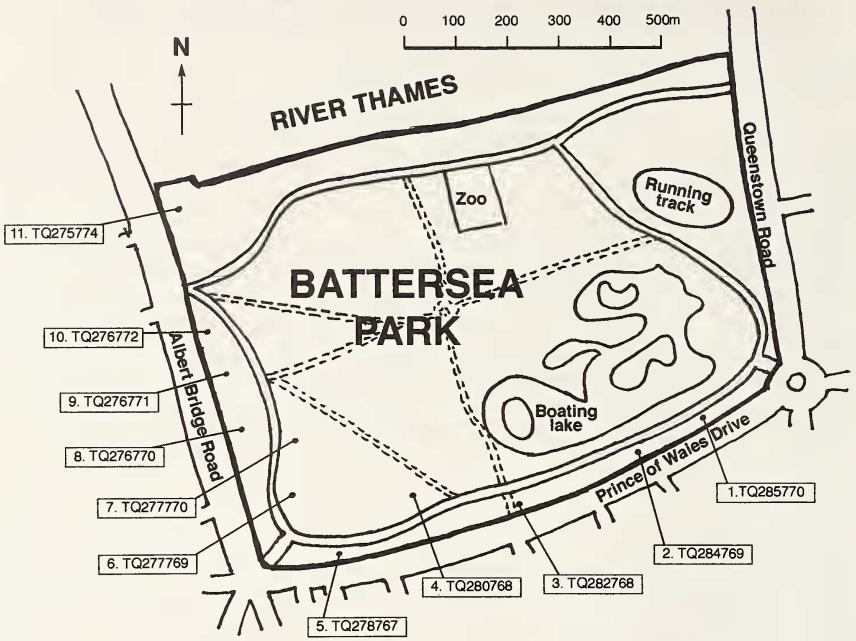

Figure 1. Sketch map of Battersea Park, showing the locations of the 11 sample sites and their grid references.

work in the Park because it was inside the contractors' security fence. It too had clumps of stinging nettle, spear thistle and ragwort in the area.

It was realized well in advance of the site visits that standard use of a sweep net would be inappropriate because the plant layer at most of the sample areas was only a few centimetres high and impossible to sweep. Similarly pit-fall trapping in well-trodden public areas is fraught with the difficulties of people or animals interfering with the pit-fall pots. Therefore a 'suction sampler' was used in all sample areas.

A suction sampler is an adapted domestic garden 'blowervac'. There are many makes and models on the market and for this study a McCulloch BVM 240 machine was used (purchased from the B&Q DIY supermarket chain for £99.99). To collect invertebrates, a muslin bag is firmly fitted over the air intake spout with a large jubilee clip. Using the suction mode, the spout is then pushed into the plant layer and the vacuum is enough to lift invertebrates and trap them, by the pressure of the rushing air, in the bag. The machine is then turned off and the contents of the bag emptied out onto a large plastic sheet for examination.

Earlier ad-hoc experiments on my garden lawn showed that a collection time of about one minute, lifting the spout up and pressing it down into the grass about once a second, generated a good sample through which to search. The opening of the suction tube of the sampler was oval, 12×14 cm, giving an aperture of approximately 132 cm^2. Sixty sucks at the ground (one per second for one minute) gave a total area of about 0.8 m^2 per sample. The sixty sucks were usually walked in a rough

circle about 3 m in diameter. This approximately uniform sample method was used on all occasions, with two suction samples being taken from each site.

Survey results

A total of 57 invertebrate species were recorded. By far the majority (40 species) were beetles. Most are very common throughout the London area, occurring in parks, gardens and woods, but three unusual species were found all represented by single specimens.

Atomaria scutellaris Motschulsky, a minute scavenger beetle, (Coleoptera: Cryptophagidae), short grass area 5, 18.vi.2002. A recent immigrant to Britain and first noted from the Isles of Scilly in 1968, this beetle is now known from a variety of habitats including saltmarsh, grasslands and woods, and it appears to be expanding its range in southern England (Johnson, 1993).

Ponera coarctata (Latreille), a small ant, (Hymenoptera: Formicidae), long grass area 11, 18.vi.2002. This diminutive and secretive ant makes only small colonies beneath stones, mosses and leaf litter. It is nationally scarce and more or less restricted to the southern counties of England where most of its sites are coastal (Barrett, 1979; Falk, 1991). This was one of the ants found in my garden lawn when the first tests of the suction sampler were carried out.

Myrmecina graminicola (Latreille) a small ant (Hymenoptera: Formicidae), area 11, 18.vi.2002. This dark and slow-moving ant is always found in low numbers, often in the nests of the yellow meadow ant *Lasius flavus* (F.) beneath stones. It is rather local and apparently restricted to the southern counties of England and Wales where many of its sites are coastal (Barrett, 1979). This was also one of the ants found in my garden lawn when the first tests of the suction sampler were carried out.

Of the 57 species recorded during this survey, only 35 were found in the short mown areas 1 to 9 (22 additional species were found in the longer grass areas 10 and 11). Of these 35 short-grass species, 14 were found only once, mostly as single specimens suggesting that although living in the turf, they were not a significant part of the fauna and may be strays from neighbouring habitats. Seven species were found in 50% or more of the sample areas. Table 1 ranks the 57 species according to the number of sample areas in which each occurred.

Discussion

Insect diversity very often reflects the diversity of the plants at a site, the diversity of plant architecture and the diversity of the surface of the substrate. The lawns and playing fields of Battersea Park are flat, uniformly cut short and almost completely dominated by rough grasses. The regime of rotary mowing constantly enriches the soil with mulched grass cuttings, fertilizing it and encouraging a limited number of grass species which become dominant, edging out other less competitive plants.

This management regime is deliberately chosen to achieve as tough and uniform a grass growth as possible for the utility nature of the Park. This is in complete contrast to other 'semi-natural' short turfs such as those grazed by sheep or rabbits. In such cases the turf height may be similar to that of a cut lawn, but constant transfer of nutrients by grazing animals, released in dung or urine elsewhere, produces a patchy nutrient-poor soil environment that discourages dominant species and leads to a plant diversity of many dozens of species per square metre. Invertebrate diversity on such sites is likewise very high.

Table 1. Ranking of the 57 invertebrate species found in grassland areas in London's Battersea Park. Seven species dominate the short mown playing fields, in that they were found in over half of the sample areas. A further 14 recurring species were found in two or more short grass sites and 14 species only in one site, usually as single specimens. Another 22 species were found only in the long-grass areas sampled for comparison

Species	Family (Coleoptera unless stated otherwise)	No. of short grass areas recorded ($n=9$)	No. of long grass areas recorded ($n=2$)
Dominant species			
Lasius niger L.	Hymenoptera: Formicidae	9	2
Unident. springtail sp. 1	Collembola	8	2
Bembidion lampros (Herbst)	Carabidae	7	0
Kissister minimus Aubé	Histeridae	7	2
Tachyporus pusillus Grav.	Staphylinidae	6	1
Unidentified money spider	Aranaea: Lyniphiidae	6	2
Megasternum obscurum Marsh.	Hydrophilidae	5	2
Other recurring species			
Sitona punctiocollis (Steph.)	Curculionidae	4	1
Forficula auricularia Lin.	Dermaptera: Forficulidae	4	1
Chasmodon apterus Esenb.	Hymenoptera: Braconidae	4	0
Amara aenea Deg.	Carabidae	3	0
Harpalus affinis Schr.	Carabidae	3	0
Amischa analis (Grav.)	Staphylinidae	3	0
Amischa forcipata (M. & R.)	Staphylinidae	3	0
Mocyta fungi (Grav.)	Staphylinidae	3	1
Philonthus nitidicollis Lac.	Staphylinidae	3	0
Tachyporus hypnorum (F.)	Staphylinidae	3	1
Unidentified bark louse	Pscoptera	3	0
Stenus ossium Steph.	Staphylinidae	2	0
Aridius bifasciatus Reit.	Lathridiidae	2	1
Lasius flavus (Fab.)	Hymenoptera: Formicidae	2	0
One short-grass site only			
Trichapion simile (Kirby)	Apionidae	1	0
Orthoperus species	Corylophidae	1	1
Atomaria scutellaris Mots.	Cryptophagidae	1	0
Tychius picirostris (Fab.)	Curculionidae	1	0
Sitona hispidulus (Fab.)	Curculionidae	1	0
Enicmus transversalis (Ol.)	Lathridiidae	1	0
Mocyta clientula (Er.)	Staphylinidae	1	0
Nehemitropia sordida (Marsh.)	Staphylinidae	1	0
Oligota pumilio Kies.	Staphylinidae	1	0
Philonthus tenuicornis M. & R.	Staphylinidae	1	0
Quedius boops Grav.	Staphylinidae	1	0
Stenus nanus Steph.	Staphylinidae	1	0
Unidentified shore fly	Diptera: Ephydridae	1	0
Unidentified springtail sp. 2	Collembola	1	0

(*Continued*)

Table 1. (*Continued*)

Species	Family (Coleoptera unless stated otherwise)	No. of short grass areas recorded ($n=9$)	No. of long grass areas recorded ($n=2$)
Only in long grass areas			
Notiophilus rufipes Curt	Carabidae	0	1
Pterostichus madidus (Lin.)	Carabidae	0	1
Longitarsus luridus Scop.	Chrysomelidae	0	1
Barypeithes pellucidus (Boh.)	Curculionidae	0	1
Gabrius nigritulus Grav.	Staphylinidae	0	1
Oxypoda adumbrata Gyl.	Staphylinidae	0	1
Rugilus orbiculatus (Payk.)	Staphylinidae	0	1
Stenus cicindeloides (Sch.)	Staphylinidae	0	1
Stenus fulvicornis Steph.	Staphylinidae	0	2
Stenus picipes Steph.	Staphylinidae	0	1
Stenus rogeri Kraatz	Staphylinidae	0	2
Tachyporus chrysomelinus (Lin.)	Staphylinidae	0	2
Tachyporus pallidulus Sharp	Staphylinidae	0	1
Anthocoris nemorum (Lin.)	Hemiptera: Anthocoridae	0	1
Orius niger (Wolff.)	Hemiptera: Anthocoridae	0	1
Unidentified flower bug	Hemiptera: Anthocoridae	0	1
Myrmecina graminicola (Latr.)	Hymenoptera: Formicidae	0	1
Ponera coarctata (Latr.)	Hymenoptera: Formicidae	0	1
Unidentified springtail sp. 3	Collembola	0	1
Philoscia muscorum (Scop.)	Isopoda: Philoscidae	0	1
Porcellio scaber (Latr.)	Isopoda: Porcellionidae	0	1

It was very much expected that a survey of the invertebrate fauna of the close-mown areas in Battersea Park would produce few species. Species numbers recorded from areas 1 to 9 were 12, 13, 15, 8, 15, 10, 7, 13 and 11, respectively. The average number of invertebrate species recorded from the nine short-grass sites was just 11.6, confirming that this habitat type has extremely low species richness.

Site 10 was slightly different from the nine short-grass sites in that, although it was mown during 2002, it was occasionally missed by the mowing machinery and this had allowed a small variety of rough herbs to grow in the area. This additional diversity in plant species and plant architecture probably accounts for the fact that 22 invertebrate species were recorded from the grass hereabouts. This demonstrates that with even a small relaxation of the mowing regime, invertebrate richness increases.

Site 11 was also different from the nine short-grass sites. It was exactly like them a year ago, but as part of the extensive building and hard-landscaping works going on in Battersea Park, it had not been mown during 2002. Consequently, the grass grew long and various rough herbs had started to establish. At this site, 21 invertebrate species were found, demonstrating that after only a few months without mowing the invertebrate species richness of the site increased.

Future invertebrate monitoring

With the agreement of Battersea Park's managers, it is intended to alter the mowing regime of some of the presently short-mown areas 1–9. Major works in the Park are part of a 'restoration' plan, to bring the Park to resemble its former glory when created 150 years ago. At that time the southern and western boundaries of the park were edged with shrubberies, where the adjacent grass was not so manicured as today. After 150 years, there are no longer any shrubs growing in these areas and the edges of the Park are dominated by large plane and other ornamental trees surrounded by mown lawn right up to the boles. Part of the restoration is expected to return these areas to shrub and to relax the mowing regime around them. Other small areas of the Park may also be allowed to grow long.

The invertebrates making use of these areas, as the grass grows longer, will be monitored during 2003 and beyond, to measure how biodiversity is increasing there.

Acknowledgements

This survey was commissioned by Robert Wells of the Battersea Park Restoration Project under the auspices of the London Borough of Wandsworth. Many of the small rove beetles (family Staphylinidae) were kindly identified by Alex Williams. Jim Brock of The Horniman Museum, Forest Hill, also offered help and advice identifying some specimens.

References

Barrett, K.E.J. 1979. *Provisional atlas of the insects of the British Isles. Part 5. Hymenoptera: Formicidae. Ants.* 2nd edn. Huntingdon: Biological Records Centre.

Falk, S. 1991. *A review of the scarce and threatened bees, wasps and ants of Great Britain.* Research and Survey in Nature Conservation. No 35. Peterborough: Nature Conservancy Council.

Johnson, C. 1993. *Provisional atlas of the Cryptophagidae–Atomariinae (Coleoptera) of Britain and Ireland.* Huntingdon: Biological Records Centre.

Jones, R.A. 1999. The terrestrial amphipod 'sandhopper' *Arcitalitrus dorrieni* and other invertebrate oddities from Battersea Park. *London Naturalist* **78:** 119–123.

Jones, R.A. 2001. *London's Battersea Park: an assessment of current invertebrate interest and future potential.* Unpublished report for London Borough of Wandsworth.

***Sisyra terminalis* Curtis (Neuroptera: Sisyridae) at Richmond Park, Surrey, in 1994.**—The report of the 14 January 2003 BENHS Indoor Meeting (*Br. J. Ent. Nat. Hist.* **16**: 196) mentions that Dr P.C. Barnard showed a specimen of the sponge fly *Sisyra terminalis* from Richmond, Surrey, found in summer 2002. The report suggests that this may have been the first London record for over 100 years, but in fact there is at least one other fairly recent record, also from the Richmond area. I recorded *S. terminalis* at the BENHS field meeting in Richmond Park (TQ1971, v.c. 17) on 6 August 1994. The specimen was caught at MV and passed to Colin Plant, to whom I am grateful for the determination.—Martin C. Harvey, Hampshire and Isle of Wight Wildlife Trust, Woodside House, Woodside Road, Eastleigh, SO50 4ET.